

SYLLABUS

1. General information on the course

Full course name	Neurosurgery
Full official name of a higher education institution	Sumy State University
Full name of a structural unit	Medical Faculty. Department of Neurosurgery and Neurology with Courses of Psychiatry, Narcology, Medical Psychology, Occupational diseases
Author(s)	Kmyta Oleksii Petrovych
Cycle/higher education level	The Second Level Of Higher Education, National Qualifications Framework Of Ukraine – The 7th Level, QF-LLL – The 7th Level, FQ-EHEA – The Second Cycle
Semester	1 week during the 9th semester, 1 week during the 10th semester
Workload	The volume of the discipline is 1.0 ECTS credits, 20 hours of practical classes, 10 years independent work of students
Language(s)	English

2. Place in the study programme

Relation to curriculum	Compulsory course available for study programme "Dental Studies"
Prerequisites	Krok-1, "Step-1", Required knowledge of: Latin and medical terminology, - medical biology, - medical informatics, - human anatomy , - physiology, - histology, cytology and embryology, - biological and bioorganic chemistry, - microbiology, virology and immunology, - pathomorphology, - pathophysiology, - pharmacology, - hygiene and ecology, - propaedeutics of pediatrics, - nursing practice, - radiology, - general surgery
Additional requirements	There are no specific requirements
Restrictions	There are no specific restrictions

3. Aims of the course

determine etiological and pathogenetic factors of the most common neurosurgical diseases to determine patient management and analysis of data supporting surveys to evaluate typical clinical picture and put a preliminary diagnosis of major neurosurgical diseases, analyze key indicators of laboratory and instrumental methods of investigation, diagnosis and provide emergency medical

care to patients with emergency conditions

4. Contents

Module 1. Neurosurgery
<p>Topic 1 "Closed traumatic brain injury"</p> <p>Closed TBI. Classification. Clinic, diagnosis and treatment of concussion, slaughter and compression of the brain. Generic trauma. Providing first aid to patients with trauma at the scene and at the prehospital stage. Modern diagnostic methods , assessment of their informativeness. Cracks and fractures of the skull. Indications for surgical treatment of traumatic brain injury in acute and remote periods. Methods of opening the cranial cavity , the principles of operations on the brain. Methods to stop bleeding from the soft tissues of the head, dura mater , blood vessels of the brain tissue. Early and late complications in closed trauma. Conservative treatment of trauma in the remote period of the disease. Rehabilitation and readaptation of patients who have undergone closed TBI. Features of the course of traumatic brain injury depending on age. Features of surgical treatment of traumatic brain injury in the elderly .</p>
<p>Topic 2 "Severe head injury. Gunshot wounds (injury) skull main brain"</p> <p>Open TBI, classification, clinic, diagnosis. Combined and combined TBI, features of clinic and diagnostics. Principles of emergency care to patients with open, combined and combined TBI on -site adventures and at different stages of evacuation. Auxiliary research methods in the diagnosis of trauma. Primary surgical treatment of open penetrating and non-penetrating wounds of the skull and brain. Early and late complications in open trauma, principles of surgical treatment. Plastics of skull bone defects. Gunshot wounds to the skull and brain, their classification and clinic. First aid for skull injuries on the battlefield. Medical sorting and content of medical care at the stages of evacuation. Peculiarities of TBI in depending on age and physical condition of patients. Emergency care, principles of treatment and prevention. Dispensary observation, rehabilitation of patients who have suffered severe and gunshot trauma.</p>
<p>Topic 3 "Spinal cord injury. Gunshot wounds (injuries) of the spine and spinal cord"</p> <p>Etiopathogenesis of traumatic lesions of the spine and spinal cord. Classification. Clinic of different types of spinal cord and spine injuries depending on the level of damage. Clinical and instrumental diagnostics. Evaluation of the revealed changes at application of auxiliary methods of diagnostics of traumatic injuries of a spinal cord and a backbone. Emergency care for patients with traumatic spinal cord injuries, basic methods and principles of transport immobilization of patients depending on the level of injury. Indications for surgical treatment of spinal cord injury. Modern methods of treatment of spinal cord and spine injuries. Prevention and treatment of complications in acute and remote periods. Rehabilitation treatment of patients. Gunshot wounds to the spine and spinal cord. Clinical picture and diagnosis. Periods of clinical course. The first medical aid in the field of battle. The amount of medical care at the stages of medical evacuation. Multiple trauma to the head, spine and other parts of the person (torso, limbs). Medical care in field conditions and extreme situations. Features of preparation for evacuation. Regulations on non-transportability.</p>

Topic 4 Injuries of the peripheral nervous system

Classification of traumatic injuries of peripheral nerves. Clinic. Diagnosis. Emergency help patients with traumatic injury to the peripheral nerves. Compression-ischemic (tunnel) neuropathy. Algorithm for determining the tactics of treatment of open and closed injuries of peripheral nerves. Basic principles and methods of surgical interventions for peripheral nerve injury depending on the type, level and mechanism of injury. Principles of rehabilitation treatment of patients in the postoperative period. Peculiarities of peripheral nerve injury and surgery in persons of advanced age.

Topic 5 Brain tumors

Classification. Clinic. Diagnosis. Pathophysiological mechanisms of hypertension syndrome formation. Cerebral and focal symptoms. Pathogenesis of primary and secondary symptoms in brain tumors. Significance of auxiliary examinations (ophthalmological examination, craniography, ultrasound, EchoEG, EEG, pneumoencephalography, angiography, computed tomography, MRI, SPECT) in the diagnosis of brain tumors. Principles of surgical treatment of tumors of the main brain in dependence on histostructure and localization. Radical and palliative operations, their principles. Combined and radiosurgical treatment of brain tumors. Emergency assistance in the syndrome of acute intracranial hypertension and dislocation syndrome. Rehabilitation and readaptation of patients after surgical intervention with regard tumors of the brain. The importance of bad habits in the occurrence of volume lesions of the brain.

Topic 6 Tumors of the spine and spinal cord. Syringomyelia

Classification. Features of the clinic depending on the location of the tumor and the nature of its growth. Modern methods of diagnosing spinal cord tumors. The value of ancillary techniques in examining patients with tumors of the spinal cord and the differential diagnosis of this pathology. Methods of surgical treatment of spinal cord tumors. Laminectomy technique. Preventing complications with tumors of the spinal cord (urosepsis, sepsis, bedsores). Rehabilitation treatment in the postoperative period. Rehabilitation of patients after removal of spinal cord tumors. Syringomyelia Classification. Pathogenesis. Clinic. Diagnosis. Emergency care. Indications to surgical treatment and its principles in dependence on the level and degree of injury. Rehabilitation treatment in the postoperative period, rehabilitation of patients. Rehabilitation and social readaptation of patients with syringomyelia.

Topic 7 Degenerative diseases of the spine

Classification. Pathogenesis. Clinic. Diagnosis. Emergency care for radicular pain. Indications for surgical treatment of degenerative diseases of the spine and its principles depending on the level and degree of damage. Restorative treatment of postoperative, rehabilitation patients. Prevention of osteochondrosis. Rehabilitation and social readaptation of patients with spinal cord and spine diseases. Syringomyelia Classification. Pathogenesis. Clinical findings. Diagnosis. Emergency care. Indications and principles of surgical treatment depending on the type and severity of a lesion. Rehabilitation in the postoperative period; rehabilitation treatment of patients. Rehabilitation and social readjustment of patients with syringomyelia.

<p>Topic 8 Vascular diseases of the brain and spinal cord</p> <p>Classification. Clinic. Etiopathogenesis. Methods of diagnosis of vascular pathology of the brain. Vascular diseases of the brain that require surgical treatment. Clinic, diagnosis and treatment of aneurysms, arteriovenous malformations, carotid-cavernous conjunctivitis in acute and remote periods. Emergency care for patients with acute cerebrovascular disorders . Modern methods of surgical treatment of patients with vascular pathology of the brain. Rehabilitation treatment in the postoperative period. Prevention of vascular diseases of the brain. Rehabilitation and readaptation of patients with cerebrovascular pathology. Features of the pathogenesis and course of pathology vessel main brain in people of advanced age. Features rehabilitation of persons older children after transferred acute violation of cerebral circulation. Types of pathology major vessels that appear acute and chronic ischemia main brain. Classification. Etiopathogenesis. Meaning of hypertensive disease and other diseases in developing atherosclerosis vessels as the main factor of disorders of cerebral circulation on ischemic type. Clinic, diagnosis and treatment of stenoses, thrombosis and thromboembolism of cerebral vessels .</p>
<p>Topic 9 "Pediatric neurosurgery. Malformations of the brain and spinal cord. Hydrocephalus"</p> <p>Pathogenesis. Clinic. Diagnosis. Classification. Auxiliary methods for diagnosing malformations of the brain and spinal cord. Prenatal diagnosis. Modern methods and principles of surgical treatment of congenital CNS lesions and hydrocephalus. The main types of surgical interventions and cerebrospinal fluid shunting operations, indications for their implementation and methods . Emergency care for shunt dysfunction . Rehabilitation and social readaptation of patients. Rehabilitation treatment of patients in the postoperative period. Prevention of malformations of the brain and spinal cord.</p>
<p>Topic 10 SUMMATIVE MODULAR ASSESSMENT</p>

5. Intended learning outcomes of the course

After successful study of the course, the student will be able to:

LO1	Acquire the skills of interviewing and objective examination of patients with neurosurgical pathology.
LO2	Justify the use of fixed invasive and non-invasive diagnostic techniques that are used in neurosurgery, able to perform medical manipulations
LO3	Carry out differential diagnosis of neurosurgical diseases, formulate a clinical diagnosis based on the evaluation of the results of laboratory and instrumental research methods .
LO4	Be able to determine the tactics of management of patients with various pathological conditions of neurosurgical diseases.
LO5	Master the basic classes of pharmacological drugs used in neurosurgical practice, apply appropriate clinical and pharmacological principles for the management of patients of different ages.
LO6	Apply in practice algorithms inspection and maintenance of patients with urgent conditions with neurosurgical diseases.
LO7	Have the tactics of providing immediate and planned surgical treatment of patients with neurosurgical pathology.

LO8	Demonstrate possession moral and deontological principles of a medical specialist and the principles of professional subordination.
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6. Role of the course in the achievement of programme learning outcomes

Programme learning outcomes achieved by the course.

For 221 Dental Studies:

PO1	To detect and identify the leading clinical symptoms and syndromes (according to the List 1); to establish the most probable nosological or syndromic preliminary clinical diagnosis of diseases (according to the List 2) using standard methods, preliminary data of the patient's anamnesis, patient's examination data, and knowledge about a human, his organs and systems.
PO2	To collect information about the patient's general condition; to assess the patient's psychomotor and physical development and the state of organs and systems of the body; to assess information on the diagnosis (according to the List 4) based on laboratory and instrumental findings.
PO3	To order and analyze additional (mandatory and optional) examinations (laboratory, radiological, functional and/or instrumental) (according to the List 4) in order to perform a differential diagnosis of diseases (according to the List 2).
PO4	To establish a final clinical diagnosis at a medical institution under control of a supervising doctor by means of informed decision and logical analysis of the obtained subjective and objective data of clinical and additional examinations, and differential diagnosis, following the relevant ethical and legal norms (according to the List 2).
PO5	To detect the key clinical syndrome or the reason for patient's condition severity (according to the List 3) via informed decision and evaluation of the person's state under any circumstances (at home, in the street, at a healthcare facility), including under emergency and military operation conditions, in the field, with a lack of information and limited time.
PO6	To determine the nature and treatment principles (conservative, operative) in patients with diseases (according to the List 2) at a healthcare facility, at patient's home or during medical evacuation process (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures based on the principles of evidence-based medicine; if needed to go beyond the standard scheme, to substantiate the personalized recommendations under control of a supervising doctor at a medical facility.
PO7	To determine an appropriate work and rest mode in the treatment of diseases (according to the List 2) at a healthcare institution, at patient's home and during medical evacuation (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures.
PO8	To determine an appropriate diet in the treatment of diseases (according to the List 2) at a healthcare institution, at patient's home and during medical evacuation (including in the field), based on the provisional clinical diagnosis and observing the relevant ethical and legal norms, by making a reasonable decision according to existing algorithms and standard procedures.

PO11	To determine the appropriate approach in emergency medical care case under any circumstances, adhering to the relevant ethical and legal norms, by making an informed decision based on the main clinical syndrome (disease severity) and emergency diagnosis (according to the List 3) using standard schemes under limited time conditions based on the principles of evidence-based medicine.
PO12	To provide emergency medical assistance under any circumstances, adhering to the relevant ethical and legal norms, by making an informed decision based on the main clinical syndrome (disease severity) and emergency diagnosis (according to the List 3) using standard schemes and predetermined approach under limited time conditions based on the principles of evidence-based medicine.
PO13	To organize medical evacuation procedures among the population and the military under emergency and military operation conditions (including in the field), and during the phases of medical evacuation, given the existing system of medical evacuation provision.
PO14	To perform medical procedures (according to the List 5) at a medical facility, at home or at work on the basis of a provisional clinical diagnosis and/or health parameters through making an informed decision and adhering to the relevant ethical and legal norms.
PO15	To perform procedures related to emergency medical assistance within a limited time and under any circumstances, using standard schemes on the basis of a medical emergency diagnosis (according to the List 3).
PO16	To plan and implement a system of sanitary and preventive measures against the occurrence and spread of diseases among the population.
PO18	To search for the necessary information in the professional literature and databases; to analyze, evaluate, and apply this information. To apply modern digital technologies, specialized software, statistical methods of data analysis to solve complex health problems.
PO19	To assess environmental impact on public health.
PO21	To organize an appropriate level of individual safety (own and of those cared for) in case of typical dangerous situations in the individual field of activity.

7. Teaching and learning activities

7.1 Types of training

Topic 1. "Closed traumatic brain injury"
pr.tr.1 "Closed TBI" (full-time course) The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching movies) with further discussion.
Topic 2. "Severe head injury. Gunshot wounds (injury) skull main brain"

pr.tr.2 "Heavy traumatic brain injury. Gunshot wound (damage) the skull, the main brain" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities consideration data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. The study of this topic involves the use of virtual simulation (watching movies about) with further discussion. Role-playing games. If possible, work at the patient's bedside in the specialized departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 3. "Spinal cord injury. Gunshot wounds (injuries) of the spine and spinal cord"

pr.tr.3 "VST" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 4. Injuries of the peripheral nervous system

pr.tr.4 "PNS" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 5. Brain tumors

pr.tr.5 "DDD" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 6. Tumors of the spine and spinal cord. Syringomyelia

pr.tr.6 "BT" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 7. Degenerative diseases of the spine

pr.tr.7 "SCT" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 8. Vascular diseases of the brain and spinal cord

pr.tr.8 "VD" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of training students used: oral examination, written test, solving situational problems, problems with the exam Step 2, control of practical skills and abilities at the bed patient examination data radiography, computer tomography, magnetic resonance imaging with the use of simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 9. "Pediatric neurosurgery. Malformations of the brain and spinal cord. Hydrocephalus"

pr.tr.9 "Pediatric Neurosurgery" (full-time course)

The control is carried out in accordance with the specific objectives of the topic, during the individual work of the teacher with the student. To assess the level of preparation of students are used: oral examination, written testing, solving situational problems, tasks from the KROK-2 exam , control of practical skills and abilities at the patient's bedside , consideration of radiography, computed tomography, magnetic resonance imaging, lumbar puncture, examination of the shunt system using a simulation center. Application of virtual simulation (watching films on the methods of instrumental and functional methods of examination) with further discussion. In the absence of quarantine restrictions, work in the departments of the medical institution (according to the agreement on cooperation between the medical institution and the university).

Topic 10. SUMMATIVE MODULAR ASSESSMENT

pr.tr.10 "Final Class" (full-time course)

To assess the level of preparation of students are used: written testing, solving situational problems, tasks from the KROK-2 exam, control of practical skills and abilities.

7.2 Learning activities

LA1	Execution of group practical task, work in the simulation center
LA2	Watching movies
LA3	E- learning in systems (Zoom, Meet, Telegram).
LA4	Self-study
LA5	Execution of practical tasks
LA6	Interpretation of instrumental research methods (radiography, CT, MRI, EchoEG).
LA7	Solving situational problems
LA8	Preparation for current and final control

8. Teaching methods

Course involves learning through:

TM1	Interactive lectures
TM2	case-based learning (CBL)
TM3	Team-based learning (TBL)
TM4	Research-based learning (RBL)
TM5	Role play
TM6	Analysis of specific situations (Case-study)
TM7	Brain storm

individual work of the teacher with the student during the oral examination, analysis, written testing with discussion of the results, solving situational problems, problems from the KROK-2 exam , control of practical skills and abilities. The discipline is taught using modern teaching methods

(CBL TBL RBL)

skills in communication, leadership, ability to take on themselves the responsibility and work in critical conditions, the ability to resolve conflicts, work in teams, manage your time, understand the importance of deadlines, the ability to think logically and systematically, creativity, ingenuity, stress

9. Methods and criteria for assessment

9.1. Assessment criteria

Definition	National scale	Rating scale
Outstanding performance without errors	5 (Excellent)	$170 \leq RD \leq 200$
Above the average standard but with minor errors	4 (Good)	$140 \leq RD < 169$
Fair but with significant shortcomings	3 (Satisfactory)	$120 \leq RD < 139$
Fail – some more work required before the credit can be awarded	2 (Fail)	$0 \leq RD < 119$

9.2 Formative assessment

FA1	Independent performance of situational exercises by students in practical classes and their discussion.
FA2	Peer assessment
FA3	Self-assessment of current testing
FA4	Interviews and oral comments of the teacher on his results
FA5	Checking and evaluating written assignments
FA6	solving clinical cases

9.3 Summative assessment

SA1	The total score for the current success of discipline
SA2	Final control: practice-oriented test (according to the regulations)
SA3	Testing
SA4	Additional types of educational work: participation in writing abstracts, articles

Form of assessment:

The semester of teaching		200 scores
SA1. The total score for the current success of discipline		120
	Assessment of theoretical knowledge, testing and practical skills	120
SA2. Final control: practice-oriented test (according to the regulations)		80
	Writing tests and situational tasks	80

Form of assessment (special cases):

The semester of teaching		200 scores
SA1. The total score for the current success of discipline		120
	In the case of quarantine restrictions practical classes are held in remote mode of application platforms Zoom, Google meet, Telegram	120
SA2. Final control: practice-oriented test (according to the regulations)		80
	In the case of quarantine restrictions practical classes are held in remote mode of application platforms Zoom, Google meet, Telegram	80

Students who have attended all classroom classes, completed the curriculum and scored at least the minimum number of points (72 points) are admitted to the final control . Final control is carried out by writing a written paper in the form of writing tests and a situational task. The maximum number of points for the final control - 80, of which: testing - 50 points; assessment of the situational task - up to 30 points. Studying the discipline, the student receives points for assessing knowledge and skills, and for additional types of educational work (incentive points) defined by the department: participation in writing an article, writing abstracts - up to 12 points.

10. Learning resources

10.1 Material and technical support

MTS1	Library funds
MTS2	Information and communication systems, simulation center
MTS3	Graphical tools (pictures, drawings, geographical maps, charts, posters , etc.)
MTS4	Computers, computer systems and networks
MTS5	KNP SOR "Regional Clinical Hospital"
MTS6	Multimedia, video and sound reproduction, projection equipment (video cameras, projectors, screens, smart boards , etc.)
MTS7	Software maintenance (to support distance learning, online surveys, virtual laboratories, virtual patients for creating computer graphics, simulation, etc. and etc.).
MTS8	Technical means (movies, radio and television programs, audio and video recordings and etc.)

10.2 Information and methodical support

Essential Reading	
1	Neurosurgery. - 2nd type. // Tsybalyuk VI. - Vinnytsia : Nova Kniga, 2020.— 360 p..
2	Neurosurgery: textbook. way. / V. A. Pyatikop, I. A. Corner, A. V. Kozachenko and others. 2019. - 152 c
Supplemental Reading	

1	Standardization in neurosurgery. Part 1. Traumatic injuries of the central and peripheral nervous system. For order. Academician of the National Academy of Medical Sciences of Ukraine, prof. E.G. Pedachenka. Kyiv: State Institution “INH NAMNU”, 2019. 152 p. https://neuro.kiev.ua/wp-content/uploads/Book_01 .
2	Standardization in neurosurgery. Part 2. Neurooncology. For order . Academician of the National Academy of Medical Sciences of Ukraine, prof. E.G. Pedachenka. Kyiv: State Institution “INH NAMNU”, 2019. 152 p. https://neuro.kiev.ua/wp-content/uploads/Book_02.pdf
3	Standardization in neurosurgery. Part 3. Vascular diseases. For order. Academician of the National Academy of Medical Sciences of Ukraine, prof. E.G. Pedachenka. Kyiv: State Institution “INH NAMNU”, 2020. 96 p. https://neuro.kiev.ua/wp-content/uploads/Book_03.pdf
4	Standardization in neurosurgery. Part 4. Pathology of the spine and spinal cord. For order. Academician of the National Academy of Medical Sciences of Ukraine, prof. E.G. Pedachenka. Kyiv: State Institution “INH NAMNU”, 2020. 144 p. https://neuro.kiev.ua/wp-content/uploads/Book_04.pdf
5	Standardization in neurosurgery. Part 5. Pediatric neurosurgery. For order. Academician of the National Academy of Medical Sciences of Ukraine, prof. E.G. Pedachenka. Kyiv: State Institution “INH NAMNU”, 2020. 352 p. https://neuro.kiev.ua/wp-content/uploads/Book_05.pdf
6	Standardization in neurosurgery. Part 6. Reconstructive and functional neurosurgery. For order. Academician of the National Academy of Medical Sciences of Ukraine, prof. E.G. Pedachenka. Kyiv: State Institution “INH NAMNU”, 2020. 144 p. https://neuro.kiev.ua/wp-content/uploads/Book_06.pdf